

CORROSION SCIENCE

**TITLE SECTION, LIST OF CONTENTS AND AUTHOR INDEX
VOLUME 34, 1993.**



PERGAMON PRESS *Oxford New York Seoul Tokyo*

CORROSION SCIENCE

An International Journal of the Science and Practice of Corrosion and Protection published under the auspices of the Institute of Corrosion and Centre Belge d'Etude de la Corrosion (CEBELCOR).

This journal publishes original papers and critical reviews in the fields of pure and applied corrosion, the degradation of materials, and both surface science and engineering. It forms an important link between metallurgists, materials scientists and all investigators of corrosion and degradation phenomena.

EDITOR-IN-CHIEF

Dr J. C. SCULLY, SCHOOL OF MATERIALS, HOULDSWORTH SCHOOL OF APPLIED SCIENCE, UNIVERSITY OF LEEDS, LS2 9JT, U.K.

EDITORIAL BOARD

Prof. CHU-NAN CAO, Corrosion Science Laboratory, Institute of Corrosion and Protection of Metals, Academia Sinica, 62 Wencui Road, Shenyang, China.

Prof. J. E. CASTLE, Department of Materials Science and Engineering, University of Surrey, Guildford, Surrey GU2 5XH, U.K.

Dr J. R. GALVELE, Departamento Materiales, Comision Nacional de Energia Atomica, Avda. Libertador 8250, 1429-Buenos Aires, Argentina.

Prof. H.-J. GRABKE, Max-Planck-Institut für Eisenforschung GMBH, 4 Düsseldorf, Max-Planck-Strasse 1, F.R.G.

Prof. K. HASHIMOTO, Institute for Materials Research, Tohoku University, Sendai 980, Japan.

Prof. H. W. PICKERING, Department of Materials Science and Engineering, Pennsylvania State University, University Park, PA, U.S.A.

Prof. M. POURBAIX, Centre Belge d'Etude de la Corrosion, Avenue Paul Heger, Grille 2, 1050 Brussels, Belgium.

Prof. F. H. STOTT, Corrosion and Protection Centre, University of Manchester Institute of Science and Technology, P.O. Box 88, Manchester M60 1QD, U.K.

Prof. Z. SZKLARSKA-SMIALOWSKA, Department of Materials Science and Engineering, The Ohio State University, 116 West 19th Avenue, Columbus, OH 43210, U.S.A.

Prof. G. E. THOMPSON, Corrosion and Protection Centre, University of Manchester Institute of Science and Technology, P.O. Box 88, Manchester M60 1QD, U.K.

Production Editor (Pergamon): Alison Gibbs. Fax: (0865) 743948.

Publishing and Advertising Offices: Headington Hill Hall, Oxford OX3 0BW, U.K. Tel.: (0865) 794141; Fax: (0865) 60285.

Volume 36 (1994) is published monthly.

Annual Institutional Subscription Rates 1994: North, Central and South America, U.S.\$1230.00, Rest of World £800.00. Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice. Subscription enquiries from customers in North America should be sent to: Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A., and for the remainder of the world to: Pergamon Press Ltd, Headington Hill Hall, Oxford OX3 0BW, U.K.

Second class postage paid at RAHWAY, NJ. Postmaster send address corrections to Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

Copyright © 1993 Pergamon Press Ltd

CONTENTS

NUMBER 1

- D. YOU, N. PEBERE and F. DABOSI
W. QAFSAOUI, G. MANKOWSKI and F. DABOSI
E. AKIYAMA, H. YOSHIOKA, J. H. KIM, H. HABAZAKI, A. KAWASHIMA, K. ASAMI and K. HASHIMOTO
M. W. KENDIG, A. J. DAVENPORT and H. S. ISAACS
R. S. DUTTA, P. K. DE and H. S. GADIYAR
H. HUANG and W. J. D. SHAW
G. S. DUFFÓ and J. R. GALVELE
J. R. BUCKLEY and D. HARDIE
C. V. D'ALKAINÉ, L. M. M. DE SOUZA and F. C. NART
C. V. D'ALKAINÉ, L. M. M. DE SOUZA and F. C. NART
C. V. D'ALKAINÉ, L. M. M. DE SOUZA and F. C. NART
A. E. BOHÉ, J. R. VILCHE and A. J. ARVIA
J. N. AL-HAJJI and M. R. REDA
Book Review
J. C. SCULLY
- 1 T. P. Hoar Award
5 An investigation of the corrosion of pure iron by electrochemical techniques and *in situ* observations
17 The pitting corrosion of pure and low alloyed copper in chloride-containing borate buffered solutions
27 The effect of magnesium on the corrosion behavior of sputter-deposited amorphous Al-Mg-Ti ternary alloys in a neutral chloride solution
41 The mechanism of corrosion inhibition by chromate conversion coatings from X-ray absorption near edge spectroscopy (XANES)
51 The sensitization and stress corrosion cracking of nitrogen-containing stainless steels
61 Cold work effects on sulfide stress cracking of pipeline steel exposed to sour environments
79 The surface mobility-stress corrosion cracking mechanism: Ag-15Pd alloy in Na₃PO₄, Na₄P₂O₇ and NaOH solutions
93 The effect of pre-straining and δ-ferrite on the embrittlement of 304L stainless steel by hydrogen
109 The anodic behaviour of niobium—I. The state of the art
117 The anodic behaviour of niobium—II. General experimental electrochemical aspects
129 The anodic behaviour of niobium—III. Kinetics of anodic film growth by potentiodynamic and galvanostatic techniques—general models, equations and their applications
151 The voltammetric behaviour of nickel in sodium hydroxide-sodium sulphide solutions
163 The corrosion of copper-nickel alloys in sulfide-polluted seawater: the effect of sulfide concentration
179 Corrosion Atlas. E. D. D. DURING
181 Corrosion Diary

NUMBER 2

- H. HABAZAKI, J. DABEK, K. HASHIMOTO, S. MROWEC and M. DANIELEWSKI
B.-P. ZHANG, H. HABAZAKI, A. KAWASHIMA, K. ASAMI and K. HASHIMOTO
J. A. CAREW and A. ABDULLAH
A. ASKEY, S. B. LYON, G. E. THOMPSON, J. B. JOHNSON, G. C. WOOD, M. COOKE and P. SAGE
A. A. WRONKOWSKA and A. WRONKOWSKI
A. TAMADA and Y. TAMURA
- 183 The sulphidation and oxidation behaviour of sputter-deposited amorphous Al-Mo alloys at high temperatures
201 The corrosion behavior of melt-spun Cr-Ni-20P alloys in concentrated hydrochloric and hydrofluoric acids
217 The influence of heat treatment on the corrosion behaviour of ferritic stainless steel solar panels in hot municipal water
233 The corrosion of iron and zinc by atmospheric hydrogen chloride
249 The corrosion behaviour of Ag-Sn alloys investigated by ellipsometry
261 The electrochemical characteristics of aluminum galvanic anodes in an Arctic seawater

Contents

D. VOUGNER, A. M. DE BECDELIEVRE, M. KEDDAM and J. M. MACKOWSKI	279	The electrochemical behaviour in acidic and chloride solutions of amorphous hydrogenated carbon thin films deposited on single crystal germanium slices (n-type) by plasma decomposition of methane
P. L. CROUSE	295	The kinetics of the reaction between an iron surface and the vapour of aqueous hydrogen fluoride
J. C. NELSON and R. A. ORIANI	307	Stress generation during anodic oxidation of titanium and aluminum
C. B. BRESLIN and W. M. CARROLL	327	The activation of aluminium by indium ions in chloride, bromide and iodide solutions
S. N. RAICHEVA, B. V. ALEKSIEV and E. I. SOKOLOVA	343	The effect of the chemical structure of some nitrogen- and sulphur-containing organic compounds on their corrosion inhibiting action
	351	Announcements
	355	Corrosion Diary

NUMBER 3

J. C. SCULLY	357	Obituary: DR L. L. SHREIR
M. THIEME and D. SCHARNWEBER	359	U. R. Evans Award 1992
M. THIEME, D. SCHARNWEBER and T. STEPHAN	363	The hydrothermal chromate treatment of carbon steel. The electrochemical and surface analytical characterisation of protecting oxide layers
M. SAKAKIBARA, N. SAITO, H. NISHIHARA and K. ARAMAKI	383	Transformations of titanium carbide precipitations under hydrothermal conditions
S. FELIU, M. MORCILLO and S. FELIU, JR	391	Corrosion of iron in anhydrous methanol
S. FELIU, M. MORCILLO and S. FELIU, JR	403	The prediction of atmospheric corrosion from meteorological and pollution parameters—I. Annual corrosion
U. HOFMANN and K. G. WEIL	423	The prediction of atmospheric corrosion from meteorological and pollution parameters—II. Long-term forecasts
M. H. WILDE and B. E. WILDE	433	On the oxidation of nickel/phosphorus alloys
K. ASAMI, H. HABAZAKI, K. KAWASHIMA and K. HASHIMOTO	445	Some observations on the mechanism of corrosion to be encountered in nuclear waste repositories located in tufaceous rock
N. XU, G. E. THOMPSON, J. L. DAWSON and G. C. WOOD	461	On the unusual morphology of pitting corrosion of amorphous Ni-Zr alloys
N. XU, G. E. THOMPSON, J. L. DAWSON and G. C. WOOD	479	The interaction of chromate species with aluminium supporting anodic films—I. Electronoptical studies
S. J. HANEEF, J. B. JOHNSON, G. E. THOMPSON and G. C. WOOD	497	The interaction of chromate species with aluminium supporting air-formed and anodic films—II. Impedance studies
S. J. HANEEF, J. B. JOHNSON, M. JONES G. E. THOMPSON, G. C. WOOD and S. A. AZZAZ	511	The degradation of coupled stones by wet deposition processes
<i>Comments</i>		A laboratory simulation of degradation of Leinster granite by dry and wet deposition processes
H. S. ISAACS	525	Comments on "A stochastic analysis of potential fluctuations during passive film breakdown and repair of iron" by M. HASHIMOTO, S. MIYAJIMA and T. MURATA
	529	Corrosion Diary

NUMBER 4

M. J. JUSTO and M. G. S. FERREIRA	531	New Member of the Editorial Board
	533	The corrosion of zinc in simulated SO ₂ -containing indoor atmospheres
M. W. BRUMM and H. J. GRABKE	547	Oxidation behaviour of NiAl—II. Cavity formation beneath the oxide scale on NiAl of different stoichiometries
N. C. SUBRAMANYAM, B. S. SHESHADRI and S. M. MAYANNA	563	Thiourea and substituted thioureas as corrosion inhibitors for aluminium in sodium nitrite solution
S. BHATTACHARJEE, N. ROY, A. K. DEY and M. K. BANERJEE	573	Statistical appraisal of the atmospheric corrosion of mild steel
G. ROCCHINI	583	The determination of electrochemical parameters by the NOLI1 method
B.-P. ZHANG, H. HABAZAKI, A. KAWASHIMA, K. ASAMI and K. HASHIMOTO	599	The corrosion behavior of Cr-P alloys in hydrofluoric acid
A. GIL, H. HOVEN, E. WALLURA and W. J. QUADAKERS	615	The effect of microstructure on the oxidation behaviour of TiAl-based intermetallics
M. J. BOZACK and R. D. BESHEARS	631	The effects of exposure temperature on 2219 Al-Cu alloy surfaces immersed in natural seawater
L. H. HIHARA and R. M. LATANISION	655	Suppressing galvanic corrosion in graphite/aluminum metal-matrix composites
M. A. BAKER and J. E. CASTLE	667	The initiation of pitting corrosion at MnS inclusions
H. KAISER	683	Selective dissolution of high and low diffusivity alloys—a comparison of kinetical and micromorphological aspects
<i>Short Communications</i>		
K. SHIMIZU, K. KOBAYASHI, G. E. THOMPSON and G. C. WOOD	701	Contribution to the paper on "Evolution of the corrosion potential of repassivating aluminium surfaces" by G. T. BURSTEIN and R. J. CINDEREY
R. B. INTURI and Z. SZKLARSKA-SMIALOWSKA	705	Dependence of the pitting potential of Al alloys on solubility of alloying element oxides
<i>Book Reviews</i>		
P. KNOTT	711	Corrosion of Glass, Ceramics and Ceramic Superconductors. Principles, Testing, Characterisation and Applications. Eds D. E. CLARK and B. K. ZOITOS
J. R. ATKINSON	712	Concise Encyclopedia of Polymer Processing & Applications, Ed. P. J. CORISH
	715	Announcement
	717	Corrigendum
	719	Corrosion Diary

NUMBER 5

J.-E. SVENSSON and L.-G. JOHANSSON	721	A laboratory study of the initial stages of the atmospheric corrosion of zinc in the presence of NaCl; influence of SO ₂ and NO ₂
MING-CHANG TSAI, WEN-TA TSAI and JU-TUNG LEE	741	The effect of heat treatment and applied potential on the stress corrosion cracking of Alloy 600 in thiosulfate solution
N. G. SMART, M. GAMBOA-ALDECOR and J. O'M. BOCKRIS	759	Corrosion mechanisms of iron in concentrated acidic zinc chloride media
B. E. EL-ANADOULI	779	The evidence for the competitive adsorption of inhibitors
G. BECH-NIELSEN and A. D. JUHL	785	Corrosion measurements by titration (CMT): copper, Sn-Zn alloy and aluminium
PH. REFAIT and J.-M. R. GÉNIN	797	The oxidation of ferrous hydroxide in chloride-containing aqueous media and Pourbaix diagrams of green rust one
A. C. HOLLIS and J. C. SCULLY	821	The stress corrosion cracking and hydrogen embrittlement of titanium in methanol-hydrochloric acid solutions
A. C. HOLLIS and J. C. SCULLY	837	The stress corrosion cracking and hydrogen embrittlement of titanium in methanol-iodine solutions
I. M. NOTTER and D. R. GABE	851	Polarisation resistance methods for measurement of the porosity of thin metal coatings

Contents

D. R. LENARD and J. G. MOORES	871	The effects of vapor phase corrosion inhibitors on the galvanic corrosion of aluminum
	881	Corrosion Diary
NUMBER 6		
J. C. SCULLY G. ROCCHINI	883	Obituary: EARL A. GULBRANSEN
E. P. SIMONEN, R. H. JONES and M. J. DANIELSON MING TINGJIANG and XU NAIXIN	885	A numerical method for the evaluation of the corrosion rate of a metal
A. TURNBULL M. C. ALONSO, R. P. M. PROCTER, C. ANDRADE and M. SÁENZ DE SANTA-MARÍA J. H. KIM, E. AKIYAMA, H. YOSHIOKA, H. HABAZAKI, A. KAWASHIMA, K. ASAMI and K. HASHIMOTO	899	Predicted salt film formation effects on stage I stress corrosion cracking of anodically polarized nickel
	915	The galvanostatic potential oscillations of mild steel in 93% sulfuric acid
	921	Modelling of environment assisted cracking
	961	Susceptibility to stress corrosion cracking of a prestressing steel in NaHCO ₃ solutions
	975	The corrosion behavior of sputter-deposited amorphous titanium-chromium alloys in 1 M and 6 M HC1 solutions
A. M. BECCARIA, G. POGGI, M. ARFELLI and G. MATTOGNNO	989	The effect of salt concentration on nickel corrosion behaviour in slightly alkaline solutions at different hydrostatic pressures
L. MARAHUSIN, S. KOKOT and and D. P. SCHWEINSBERG A. W. HARRIS, J. S. BROWN and A. ATKINSON <i>Short Communication</i> G. HULTQUIST, L. GRÄSJÖ and Q. LU	1007	The electrogeneration of oxygen at copper and iron electrodes and its interaction with cotton fabric
<i>Book Review</i> J. C. SCULLY	1017	The re-oxidation of pre-formed nickel oxide scales
	1035	Consumption and release of gas components during the reaction of iron at 300°C in a H ₂ ¹⁶ O/H ₂ ¹⁸ O/O ₂ gas mixture
	1039	DECHEMA Corrosion Handbook, Volume 10, Carboxylic Acid Esters, Drinking Water and Nitric Acid. Ed. D. BEHRENS
	1043	Corrosion Diary
NUMBER 7		
G. M. BROWN, K. SHIMIZU, K. KOBAYASHI, G. E. THOMPSON and G. C. WOOD	1045	The growth of chromate conversion coatings on high purity aluminium
A. ASKEY, S. B. LYON, G. E. THOMPSON, J. B. JOHNSON, G. C. WOOD, P. W. SAGE and M. J. COOKE	1055	The effect of fly-ash particulates on the atmospheric corrosion of zinc and mild steel
P. ERIKSSON, L.-G. JOHANSSON and J. GULLMAN	1083	A laboratory study of corrosion reactions on statue bronze
C. B. BRESLIN and W. M. CARROLL	1099	The effects of indium precipitates on the electrochemical dissolution of Al-In alloys
T. SUTER, E. M. MOSER and H. BÖHNI	1111	The characterization of the tarnishing of Cu-15Ni-8Sn and Cu-5Al-5Sn alloys
P. MARCUS and J.-M. HERBELIN	1123	The entry of chloride ions into passive films on nickel studied by spectroscopic (ESCA) and nuclear (³⁶ Cl radio-tracer) methods
A. PIRNÁT, L. MÉSZÁROS, G. MÉSZÁROS and B. LENGYEL	1147	A measuring method and instrument for the evaluation of corrosion resistance of chromate layers

Y. SHIDA, H. FUJIKAWA and Y. SAWARAGI	1157	The oxidation and carbon transfer behaviour of Ni-27Cr-5Mo-5W based alloys in an impure helium atmosphere at high temperature
MAO-YING TENG and IUAN-JOU YANG	1173	The electrochemical evaluation and surface analysis of materials in <i>para</i> -toluene sulphonic acids
M. TOUZET, M. CID, M. PUIGGALI and M. C. PETIT	1187	An EIS study and Auger analysis on 304L stainless steel in hot chloride media before and after a sample straining
	1197	Announcement
	1199	Corrosion Diary

NUMBER 8

R. B. INTURI and Z. SZKLARSKA-SMIALOWSKA	1201	Structure, composition and pitting behavior of sputtered Al, Al-Cr and Al-Ta films
I. ODNEVALL and C. LEYGRAF	1213	Formation of $\text{NaZn}_4\text{Cl}(\text{OH})_6\text{SO}_4 \cdot 6\text{H}_2\text{O}$ in a marine atmosphere
I. ODNEVALL and M. WESTDAHL	1231	Zinc chlorohydroxosulfates: newly-discovered corrosion products on zinc. Structure determination of $\text{NaZn}_4\text{Cl}(\text{OH})_6\text{SO}_4 \cdot 6\text{H}_2\text{O}$ and X-ray study of $\text{Zn}_4\text{Cl}_2(\text{OH})_4\text{SO}_4 \cdot 5\text{H}_2\text{O}$
W. KINDELIN, JR, P. T. SCHILLING, R. M. SCHROEDER and I. L. MÜLLER	1243	The characterization of the sulphide stress-corrosion susceptibility of high-strength low-alloy steels in standardized solutions
R. D. BRAUN, E. E. LOPEZ and D. P. VOLLMER	1251	Low molecular weight straight-chain amines as corrosion inhibitors
C. COMPÈRE, É. FRÉCHETTE and E. GHALI	1259	The corrosion evaluation of painted and artificially damaged painted steel panels by AC impedance measurements
R. K. SINGH RAMAN and J. B. GNANAMOORTHY	1275	The oxidation behaviour of the weld metal, heat affected zone and base metal in the weldments of 2.25Cr-1Mo steel
V. OTIENO-ALEGO, G. A. HOPE, H. J. FLITT and D. P. SCHWEINSBERG	1289	The effect of hydroquinone and methoxypropylamine on the pitting corrosion behaviour of A-470 low alloy turbine disc steel
J. H. GERRETSEN and A. VISSER	1299	Inhibitor performance under liquid droplet impingement conditions in CO_2 -containing environment
G. L. MAKAR, J. KRUGER and K. SIERADZKI	1311	Stress corrosion cracking of rapidly solidified magnesium-aluminum alloys
P. Q. ZHANG, J. X. WU, W. Q. ZHANG, X. Y. LU and K. WANG	1343	A pitting mechanism for passive 304 stainless steel in sulphuric acid media containing chloride ions
S. NASRAZADANI and A. RAMAN	1355	The application of infrared spectroscopy to the study of rust systems—II. Study of cation deficiency in magnetite (Fe_3O_4) produced during its transformation to maghemite ($\gamma\text{-Fe}_2\text{O}_3$) and hematite ($\alpha\text{-Fe}_2\text{O}_3$)
P. S. JOSHI, G. VENKATESWARAN and K. S. VENKATESWARLU	1367	Passivation of carbon steel alloy in de-oxygenated alkaline pH media. The effect of various additives
	1381	Announcements
	1383	Corrosion Diary

NUMBER 9

S. RAMAMURTHY and A. ATRENS	1385	The stress corrosion cracking of as-quenched 4340 and 3.5NiCrMoV steels under stress rate control in distilled water at 90°C
MING-QI LI, ZHEN-WEI WEI, FU-SHENG ZHANG and JIE-QING TANG G. L. BIANCHI and J. R. GALVELE	1403	The corrosion fatigue of medium strength structural steels
	1411	Stress corrosion cracking of pure copper and pure silver in gaseous environments

Contents

E. GULBRANDSEN, J. TAFTØ and A. OLSEN	1423	The passive behaviour of Mg in alkaline fluoride solutions. Electrochemical and electron microscopical investigations
K. TANNO, M. ITOH, T. TAKAHASHI, H. YASHIRO and N. KUMAGAI	1441	The corrosion of carbon steel in lithium bromide solution at moderate temperatures
K. TANNO, M. ITOH, H. SEKIYA, H. YASHIRO and N. KUMAGAI	1453	The corrosion inhibition of carbon steel in lithium bromide solution by hydroxide and molybdate at moderate tempera- tures
R. NISHIMURA	1463	The effect of potential on stress corrosion cracking of type 316 and type 310 austenitic stainless steels
K. SHIMIZU, K. KOBAYASHI, G. E. THOMPSON and G. C. WOOD	1475	A novel technique for ready determination of cathodic activity of intermetallic compounds during corrosion of aluminium
M. FAVRE and D. LANDOLT	1481	The influence of gallic acid on the reduction of rust on painted steel surfaces
W. M. CARROLL, M. MURPHY and C. B. BRESLIN	1495	The corrosion/dissolution behaviour of aluminium in solu- tions containing both chloride and fluoride ions
E. P. M. VAN WESTING, G. M. FERRARI and J. H. W. DE WIT	1511	The determination of coating performance with impedance measurements—I. Coating polymer properties
J. MORALES, P. ESPARZA, S. GONZÁLEZ, R. SALVAREZZA and M. P. ARÉVALO	1531	The role of <i>Pseudomonas aeruginosa</i> on the localized corrosion of 304 stainless steel
T. A. CRABB, P. N. GIBSON and E. MCALPINE	1541	A study of the effects of yttrium additions on the initial stages of oxidation of Ni–20Cr using glancing angle X-ray techniques
<i>Short Communications</i>		
A. J. BETTS and R. C. NEWMAN	1551	The effect of alloyed molybdenum on the activation of anodic dissolution by reduced sulphur compounds
M. THIEME	1557	Characterisation of oxide layers formed by hydrothermal chromate treatment (HTCT) on Incoloy- and Inconel-type alloys
	1561	Announcement
	1563	Corrosion Diary

NUMBER 10

J. C. SCULLY	1565	Obituary: PROFESSOR H. H. UHLIG
C. DESLOUIS, M. C. LAFONT, N. PEBERE and D. YOU	1567	Corrosion inhibition of pure iron in neutral solutions by electrochemical techniques
E. OTERO and J. J. ROYUELA	1581	The assessment of short term data of pipe corrosion in drinking water—I. Galvanized steel
J. J. ROYUELA and E. OTERO	1595	The assessment of short term data of pipe corrosion in drinking water—II. Copper
ZILONG TANG and SHIZHE SONG	1607	The potentiostatic–galvanostatic transient response charac- ter of a passive system with adsorption
E. OTERO, A. PARDO, M. LAGUNA and F. J. PÉREZ	1617	The influence of the mixing procedure and the copper proportion on the corrosion resistance of Fe–Cu sintered products in SO ₂ contaminated atmospheres
K. HOFFMANN and M. STRATMANN	1625	The delamination of organic coatings from rusty steel substrates
WEN-TA TSAI, B. REYNERS, M. STRATMANN and H. J. GRABKE A. LENG and M. STRATMANN	1647	The effect of applied potential on the stress corrosion cracking behavior of high nitrogen steels
Y. MASSIANI, J. P. CROUSIER and A. LAZZERI	1657	The inhibition of the atmospheric corrosion of iron by vapour-phase inhibitors
YU ZUO and R. M. LATANISION	1685	Studies of the corrosion protection of immersed metallic structures by sub-aquatic applications of epoxy coatings
K. H. W. SEAH, K. B. LIM, C. H. CHEW and S. H. TEOH	1697	The pitting corrosion of amorphous Ni ₆₃ Cr _{12.5} Fe ₄ Si ₈ B _{12.5} alloy in chloride solution
	1707	The correlation of acoustic emission with rate of corrosion

Q. LE XUAN, J. KRAIEM and K. VU QUANG	1715	New aspects of the galvanokinetic polarization technique for pitting corrosion studies
V. B. SINGH and S. M. A. HOSSEINI	1723	The electrochemical and corrosion behaviour of titanium and its alloy (VT-9) in phosphoric acid
I. B. SINGH and U. SEN	1733	The effect of NaCl addition on the corrosion of mild steel in NaNO ₃ melt
<i>Short Communication</i>		
D. J. SIMBI and J. C. SCULLY	1743	The intergranular stress corrosion cracking of Ti 155 in methanol/HCl at room temperature
<i>Discussion</i>		
A. TURNBULL	1751	Anodic iron oxide films and their effect on the hydro- gen permeation through steel, by P. BRUZZONI and R. GARAVAGLIA
<i>Book Review</i>		
J. C. SCULLY	1753	DECHEMA Corrosion Handbook, Volume 11, Chlorine Dioxide and Seawater. Ed. D. BEHRENS
	1757	Announcement
	1759	Corrosion Diary

NUMBER 11

L. H. HIHARA and P. K. KONDEPUDI	1761	The galvanic corrosion of SiC monofilament/ZE41 Mg metal-matrix composite in 0.5 M NaNO ₃
Y. C. LU and M. B. IVES	1773	The improvement of the localized corrosion resistance of stainless steel by cerium
S. TEBBAL and N. HACKERMAN	1787	Liquid film thickness and weak acids in the CO ₂ pitting of steel
A. SCHÜSSLER and H. E. EXNER	1793	The corrosion of nickel-aluminium bronzes in sea- water—I. Protective layer formation and the passivation mechanism
A. SCHÜSSLER and H. E. EXNER	1803	The corrosion of nickel-aluminium bronzes in sea- water—II. The corrosion mechanism in the presence of sulphide pollution
J. H. KIM, E. AKIYAMA, H. HABAZAKI, A. KAWASHIMA, K. ASAMI and K. HASHIMOTO	1817	The corrosion behavior of sputter-deposited amorphous chromium-zirconium alloys in 6 M HCl solution
B.-M. IM, E. AKIYAMA, H. HABAZAKI, A. KAWASHIMA, K. ASAMI and K. HASHIMOTO	1829	Electrochemical and XPS studies of the effects of alloying elements on the corrosion behavior of amorphous Fe-Cr- metalloid alloys in 9 M H ₂ SO ₄
K. H. W. SEAH and X. CHEN	1841	A comparison between the corrosion characteristics of 316 stainless steel, solid titanium and porous titanium
K. SHIMIZU, G. M. BROWN, K. KOBAYASHI, G. E. THOMPSON and G. C. WOOD	1853	The role of electron tunnelling in the development of chemical conversion coatings on high purity aluminium
R. NISHIMURA	1859	The effect of chloride ions on stress corrosion cracking of type 304 and type 316 austenitic stainless steels in sulfuric acid solution
W. C. McKEAN and R. D. BRAUN	1869	Chromatographic and iron carbonate dissolution methods for evaluating active ingredients in corrosion inhibitors
A. J. HUTCHINSON, J. B. JOHNSON, G. E. THOMPSON, G. C. WOOD, P. W. SAGE and M. J. COOKE	1881	Stone degradation due to wet deposition of pollutants
J. N. ALHAJJI and M. R. REDA	1899	The effect of alloying elements on the electrochemical corrosion of low residual carbon steels in stagnant CO ₂ - saturated brine
C. LEMAÎTRE, A. ABDEL MONEIM, R. DJOUDJOU, B. BAROUX and G. BERANGER	1913	A statistical study of the role of molybdenum in the pitting resistance of stainless steels

Contents

B. BOELEN, B. SCHMITZ,
J. DEFOURNY and F. BLEKKENHORST

Book Review
J. C. SCULLY

- 1923 A literature survey on the development of an accelerated laboratory test method for atmospheric corrosion of pre-coated steel products
- 1933 Encyclopedia of Materials Science and Engineering, Supplementary Volume 3. Ed. R. W. CAHN
- 1935 Corrosion Diary

NUMBER 12

M. SAKAKIBARA, H. NISHIHARA
and K. ARAMAKI

J. H. KIM, E. AKIYAMA,
H. HABAZAKI, A. KAWASHIMA,
K. ASAMI and K. HASHIMOTO

X. G. ZHANG and E. M. VALERIOTE

R. B. INTURI and Z. SZKLARSKA-
SMIAŁOWSKA

E. C. COONEY and D. I. POTTER

E. C. COONEY and D. I. POTTER'

G. ROCCHINI

G. ROCCHINI

F. MANSFELD, S. H. LIN and
L. KWIATKOWSKI
PH. REFAIT and J.-M. R. GÉNIN

J. S. CHEN, M. SALMERON
and T. M. DEVINE

Short Communications

G. M. BROWN, K. SHIMIZU,
K. KOBAYASHI, G. E. THOMPSON
and G. C. WOOD

F. MANSFELD and
J. C. S. FERNANDES

Discussion

P. BRUZZONI

- 1937 The effects of complexing agents on the corrosion of iron in an anhydrous methanol solution
- 1947 The corrosion behavior of sputter-deposited amorphous Cr-Nb and Cr-Ta alloys in 12 M HCl solution
- 1957 Galvanic protection of steel and galvanic corrosion of zinc under thin layer electrolytes
- 1973 The pitting corrosion of sputtered Fe base alloy films
- 1991 Microstructural and corrosive interactions in phosphorus ion implanted 304L stainless steel—I. Alterations in microstructure by implantation
- 2007 Microstructural and corrosive interactions in phosphorus ion implanted 304L stainless steel—II. Alterations in corrosion resistance by implantation
- 2019 The influence of the ohmic drop on the shape of polarization curves
- 2031 Corrosion rate monitoring by the linear polarization method
- 2045 The effects of process parameters on alternating voltage (AV) passivation of 304 stainless steel
- 2059 The oxidation of Ni(II)-Fe(II) hydroxides in chloride-containing aqueous media
- 2071 Intergranular and transgranular stress corrosion cracking of Cu-30Au
- 2099 Further evidence for the presence of residual flaws in a thin oxide layer covering high purity aluminium
- 2105 Impedance spectra for aluminum 7075 during the early stages of immersion in sodium chloride
- 2109 Anodic iron oxide films and their effect on the hydrogen permeation through steel, by P. BRUZZONI and R. GARAVAGLIA
- 2111 Announcements
- 2115 Corrosion Diary
- i Index to Vol. 34

AUTHOR INDEX

- Abdel Moneim, A. 1913
Abdullah, A. 217
Akiyama, E. 27, 975, 1817, 1829, 1947
Al-Hajji, J. N. 163
Aleksiev, B. V. 343
Alhajji, J. N. 1899
Alonso, M. C. 961
Andrade, C. 961
Aramaki, K. 391, 1937
Arévalo, M. P. 1531
Arfelli, M. 989
Arvia, A. J. 151
Asami, K. 27, 201, 445, 599, 975, 1817, 1829, 1947
Askey, A. 233, 1055
Atkinson, A. 1017
Atkinson, J. R. 712
Atrens, A. 1385
Azzaz, S. A. 511

Baker, M. A. 667
Banerjee, M. K. 573
Baroux, B. 1913
Beccaria, A. M. 989
Bech-Nielsen, G. 785
Beranger, G. 1913
Beshears, R. D. 631
Betts, A. J. 1551
Bhattacharjee, S. 573
Bianchi, G. L. 1411
Blekkenhorst, F. 1923
Bockris, J. O'M. 759
Boelen, B. 1923
Bohé, A. E. 151
Böhni, H. 1111
Bozack, M. J. 631
Braun, R. D. 1251, 1869
Breslin, C. B. 327, 1099, 1495
Brown, G. M. 1045, 1853, 2099
Brown, J. S. 1017
Brumm, M. W. 547
Bruzzone, P. 2109
Buckley, J. R. 93

Carew, J. A. 217
Carroll, W. M. 327, 1099, 1495
Castle, J. E. 667
Chen, J. S. 2071
Chen, X. 1841
Chew, C. H. 1707
Cid, M. 1187
Compère, C. 1259
Cooke, M. 233
Cooke, M. J. 1055, 1881
Cooney, E. C. 1991, 2007
Crabb, T. A. 1541

Crouse, P. L. 295
Crousier, J. P. 1685

D'Alkaine, C. V. 109, 117, 129
Dabek, J. 183
Dabosi, F. 5, 17
Danielewski, M. 183
Danielson, M. J. 899
Davenport, A. J. 41
Dawson, J. L. 461, 479
de Becdelievre, A. M. 279
de Souza, L. M. M. 109, 117, 129
de Wit, J. H. W. 1511
De, P. K. 51
Defourny, J. 1923
Deslouis, C. 1567
Devine, T. M. 2071
Dey, A. K. 573
Djoudjou, R. 1913
Duffó, G. S. 79
Dutta, R. S. 51

El-Anadouli, B. E. 779
Eriksson, P. 1083
Esparza, P. 1531
Exner, H. E. 1793, 1803

Favre, M. 1481
Feliu, S. 403, 415
Feliu, S. Jr 403, 415
Fernandes, J. C. S. 2105
Ferrari, G. M. 1531
Ferreira, M. G. S. 533
Flitt, H. J. 1289
Fréchette, É. 1259
Fujikawa, H. 1157

Gabe, D. R. 851
Gadiyar, H. S. 51
Galvele, J. R. 79, 1411
Gamboa-Aldeco, M. 759
Génin, J.-M. R. 797, 2059
Gerretsen, J. H. 1299
Ghali, E. 1275
Gibson, P. N. 1541
Gil, A. 615
Gnanamoorthy, J. B. 1275
González, S. 1531
Grabke, H. J. 547, 1647
Gråsjö, L. 1035
Gulbrandsen, E. 1423
Gullman, J. 1083

Habazaki, H. 27, 183, 201, 445, 599, 975, 1817, 1829, 1947
Hackerman, N. 1787

- Haneef, S. J. 497, 511
 Hardie, D. 93
 Harris, A. W. 1017
 Hashimoto, K. 27, 183, 201, 445, 599, 975,
 1817, 1829, 1947
 Herbelin, J.-M. 1123
 Hihara, L. H. 655, 1761
 Hoffmann, K. 1625
 Hofmann, U. 423
 Hollis, A. C. 821, 837
 Hope, G. A. 1289
 Hosseini, S. M. A. 1723
 Hoven, H. 615
 Huang, H. 61
 Hultquist, G. 1035
 Hutchinson, A. J. 1881
- Im, B.-M. 1829
 Inturi, R. B. 705, 1973, 1201
 Isaacs, H. S. 41, 525
 Itoh, M. 1441, 1453
 Ives, M. B. 1773
- Johansson, L.-G. 721, 1083
 Johnson, J. B. 233, 497, 511, 1055, 1881
 Jones, M. 511
 Jones, R. H. 899
 Joshi, P. S. 1367
 Juhl, A. D. 785
 Justo, M. J. 533
- Kaiser, H. 683
 Kawashima, A. 27, 201, 445, 599, 975, 1817,
 1829, 1947
 Keddam, M. 279
 Kendig, M. W. 41
 Kim, J. H. 27, 975, 1817, 1947
 Kindlein, Jr, W. 1243
 Knott, P. 711
 Kobayashi, K. 701, 1045, 1475, 1853, 2099
 Kokot, S. 1007
 Kondepudi, P. K. 1761
 Kraiem, J. 1715
 Kruger, J. 1311
 Kumagai, N. 1441, 1453
 Kwiatkowski, L. 2045
- Lafont, M. C. 1567
 Laguna, M. 1617
 Landolt, D. 1481
 Latanision, R. M. 655, 1697
 Lazzeri, A. 1685
 Le Xuan, Q. 1715
 Lee Ju-Tung 741
 Lemaitre, C. 1913
 Lenard, D. R. 871
 Leng, A. 1657
 Lengyel, B. 1147
 Leygraf, C. 1213
 Li Ming-qi 1403
 Lim, K. B. 1707
 Lin, S. H. 2045
 Lopez, E. E. 1251
 Lu, Q. 1035
- Lu, X. Y. 1343
 Lu, Y. C. 1773
 Lyon, S. B. 233, 1055
- Mackowski, J. M. 279
 Makar, G. L. 1311
 Mankowski, G. 17
 Mansfeld, F. 2045, 2105
 Marahusin, L. 1007
 Marcus, P. 1123
 Massiani, Y. 1685
 Mattogno, G. 989
 Mayanna, S. M. 563
 McAlpine, E. 1541
 McKean, W. C. 1869
 Mészáros, G. 1147
 Mészáros, L. 1147
 Ming Tingjiang 915
 Moores, J. G. 871
 Morales, J. 1531
 Morcillo, M. 403, 415
 Moser, E. M. 1111
 Mrowec, S. 183
 Müller, I. L. 1243
 Murphy, M. 1495
- Nart, F. C. 109, 117, 129
 Nasrazadani, S. 1355
 Nelson, J. C. 307
 Newman, R. C. 1551
 Nishihara, H. 391, 1937
 Nishimura, R. 1463, 1859
 Notter, I. M. 851
- Odnevall, I. 1213, 1231
 Olsen, A. 1423
 Oriani, R. A. 307
 Otero, E. 1581, 1595, 1617
 Otieno-Alego, V. 1289
- Pardo, A. 1617
 Pebere, N. 5, 1567
 Pérez, F. J. 1617
 Petit, M. C. 1187
 Pirnát, A. 1147
 Poggi, G. 989
 Potter, D. I. 1991, 2007
 Procter, R. P. M. 961
 Puiggali, M. 1187
- Qafsaoui, W. 17
 Quadakkers, W. J. 615
- Raicheva, S. N. 343
 Ramamurthy, S. 1385
 Raman, A. 1355
 Reda, M. R. 163, 1899
 Refait, Ph. 797, 2059
 Reynders, B. 1647
 Rocchini, G. 583, 885, 2019, 2031
 Roy, N. 573
 Royuela, J. J. 1581, 1595
- Sáenz de Santa-María, M. 961

- Sage, P. 233
Sage, P. W. 1055, 1881
Saito, N. 391
Sakakibara, M. 391, 1937
Salmeron, M. 2071
Salvarezza, R. 1531
Sawaragi, Y. 1157
Scharnweber, D. 363, 383
Schilling, P. T. 1243
Schmitz, B. 1923
Schroeder, R. M. 1243
Schüssler, A. 1793, 1803
Schweinsberg, D. P. 1017, 1289
Scully, J. C. 179, 357, 821, 837, 883, 1039,
1565, 1743, 1753, 1933
Seah, K. H. W. 1707, 1841
Sekiya, H. 1453
Sen, U. 1733
Shaw, W. J. D. 61
Sheshadri, B. S. 563
Shida, Y. 1157
Shimizu, K. 701, 1045, 1475, 1853, 2099
Sieradzki, K. 1311
Simbi, D.. J. 1743
Simonen, E. P. 899
Singh Raman, R. K. 1275
Singh, I. B. 1733
Singh, V. B. 1723
Smart, N. G. 759
Sokolova, E. I. 343
Song Shizhe 1607
Stephan, T. 383
Stratmann, M. 1625, 1647, 1657
Subramanyam, N. C. 563
Suter, T. 1111
Svensson, J.-E. 721
Szklarska-Smialowska, Z. 705, 1201, 1973

Tafto, J. 1423
Takahashi, T. 1441
Tamada, A. 261
Tamura, Y. 261
Tang Jie-qing 1403
Tang Zilong 1607
Tanno, K. 1441, 1453
Tebbal, S. 1787
Teng Mao-Ying 1173

Teoh, S. H. 1707
Thieme, M. 1557
Thieme, M. 363, 383
Thompson, G. E. 233, 461, 479, 497, 511, 701,
1045, 1055, 1475, 1853, 1881, 2099
Touzet, M. 1187
Tsai Ming-Chang 741
Tsai Wen-Ta 741, 1647
Turnbull, A. 921, 1751

Valeriote, E. M. 1957
van Westing, E. P. M. 1511
Venkateswaran, G. 1367
Venkateswarlu, K. S. 1367
Vilche, J. R. 151
Visser, A. 1299
Vollmer, D. P. 1251
Vouagner, D. 279
Vu Quang, K. 1715

Wallura, E. 615
Wang, K. 1343
Wei Zhen-wei 1403
Weil, K. G. 423
Westdahl, M. 1231
Wilde, B. E. 433
Wilde, M. H. 433
Wood, G. C. 233, 461, 479, 497, 511, 701,
1045, 1055, 1475, 1853, 1881, 2099
Wronkowska, A. A. 249
Wronkowski, A. 249
Wu, J. X. 1343

Xu Naixin 915
Xu, N. 461, 479

Yang Iuan-Jou 1173
Yoshioka, H. 27, 975, 1453
You, D. 5, 1567

Zhang Fu-sheng 1403
Zhang, B.-P. 201, 599
Zhang, P. Q. 1343
Zhang, W. Q. 1343
Zhang, X. G. 1957
Zuo Yu 1697

